

**CONTACT
INFORMATION**

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EDUCATION

Technical University of Munich (TUM)	<i>June 2025 – June 2026</i>
Visiting graduate student within the group of Elisa Resconi	
Michigan State University (MSU)	<i>September 2021 – June 2026</i>
Advised by Nathan Whitehorn Doctor of Philosophy in Physics (expected 2026). GPA: 3.89 <i>Dissertation with focus on stochastic modeling and statistical inference for partially observed systems, domain applications</i>	
University of California, Los Angeles (UCLA)	<i>September 2017 – March 2021</i>
Advised by Rene Ong, Nathan Whitehorn and Alexander Kusenko Bachelor of Science in Physics. GPA: 3.89 Magna Cum Laude, Highest Departmental Honors	

**RESEARCH
INTERESTS**

- Measure-theoretic probability and stochastic processes
 - Interacting particle systems and agent-based models
 - Adaptive networks and transport over networks
 - Scaling limits relevant within spatiotemporal population dynamics
 - Statistical inference of complex systems
- Applications in ecology, anthropology and social systems*

**SELECTED
PREPRINTS
AND WORK IN
PROGRESS**

- (*Submitted to Journal of Theoretical Biology*) Alina Kochocki. 2026 “Threshold Resource Redistribution in Spatially-Structured Kinship Networks”. A process of threshold-based resource redistribution on networks. Studied a two-dimensional stepping-stone population model with local interactions and redistribution dependent on agent lineage network structure. Focused on the relation between network topology, resource density, and population persistence.
- (*Work in progress*) Alina Kochocki. 2026 Ph.D. Thesis Section, “Statistical Inference for a Rare-Event Process with High-Dimensional, Observational Data”. Develops statistical inference methods for rare-event stochastic processes under partial observability using measure-theoretic probability, with applications to high-energy physics and astrophysics.
- (*Work in progress*) Alina Kochocki. 2026 Ph.D. Thesis Section, “Machine Learning Processes with Applications in High-Energy Physics”. A discussion of classification and generative modeling for observational data, with emphasis on statistical structure and assumptions.

AWARDS AND HONORS	Dissertation Completion Fellowship, Michigan State University Michigan State University STEM Ambassador, STEMAP National Science Foundation GRFP – Honorable Mention University Distinguished Fellowship, Michigan State University College of Natural Science Fellowship, Michigan State University Recruiting Fellowship, Michigan State University Selected Graduate Fellowships – declined for personal reasons ¹ : <ul style="list-style-type: none"> • James Mills Peirce Fellowship, Harvard Physics • Stanford Graduate Fellow, Stanford Physics • KIPAC Graduate Fellowship, Stanford Physics • Princeton Graduate Fellowship, Princeton Physics USRA Distinguished Undergraduate Award – Honorable Mention Undergraduate Research Scholar, UCLA URC Honors Summer Research Stipend Award, UCLA College Honors Undergraduate Research Scholar, UCLA URC Frederick R. Waingrow Peterson Publishing Company Scholarship Undergraduate Research Fellow, UCLA URC Invited Member of UCLA College Honors Program	October 2025 February 2023 April 2022 February 2021 February 2021 February 2021 February 2021 August 2020 August 2020 June 2020 August 2019 April 2019 December 2018 April 2017
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SELECTED TALKS	<ul style="list-style-type: none"> • Three plenaries and sixteen parallel presentations between 2022 and 2025 at IceCube collaboration meetings. Meetings are typically attended by ~200 collaborators and are held twice yearly – within and outside of the United States. • International Cosmic Ray Conference (Geneva, Switzerland) – July 2025. • (<i>Invited</i>) Northwestern CIERA Theory Seminar (Evanston, USA) – April 2025. • (<i>Invited</i>) UCLA TEPAPP Seminar (Los Angeles, USA) – March 2025. • American Physical Society Global Physics Summit (Anaheim, USA) – March 2025. • (<i>Invited</i>) PACIFIC (Moorea, French Polynesia) – August 2024. • (<i>Invited</i>) Turbulence in Astrophysical Environments (Santa Barbara, USA) – February 2024. • TeV Particle Astrophysics (Napoli, Italy) – September 2023. • 27th European Cosmic Ray Symposium (Nijmegen, the Netherlands) – July 2022. • 237th Meeting of the American Astronomical Society – January 2021. • UCLA Undergraduate Research Virtual Showcase – May 2020. 	
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OTHER SELECTED PUBLICATIONS	<ul style="list-style-type: none"> • (<i>In prep</i>) The IceCube Collaboration². 2025 “Timing Resolution of the IceCube Upgrade mDOM”. • (<i>In prep</i>) Alina Kochocki, Sam Hori, Emma Kun. 2025 “Delayed Gamma-ray and Radio Flaring Activity in a Selection of Fermi-LAT AGN”. • (<i>In prep</i>) Alina Kochocki and Xavier Rodrigues. 2025 “An Evolving Leptonic Jet Model for Delayed Radio Flares in Neutrino Blazars”. • (<i>Collaboration review</i>) The IceCube Collaboration. 2025 “A Time-Dependent Search for Neutrino Emission from Flaring X-ray Binaries”. 	
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¹Declined fellowship offers are not traditionally listed. As these were also exceptional offers, I have chosen to list them.

²IceCube authorship policies are described here. The listed papers represent first-author contributions.

- Kochocki et al. for the IceCube Collaboration. 2025 “A Search for Astrophysical Neutrinos from Flaring X-ray Binaries with IceCube”. *PoS*, ICRC, 1077
- (*Accepted, ApJ*) The IceCube Collaboration and Atacama Cosmology Telescope. 2024 “A Search for Millimeter-Bright Blazars as Astrophysical Neutrino Sources”.
- Alina Kochocki for the IceCube-Gen2 Collaboration. 2023 “Forecasted Sensitivity of IceCube-Gen2 to the Astrophysical Diffuse Spectrum”. *PoS*, ECRS, 100
- Alina Kochocki, Volodymyr Takhistov, Alexander Kusenko and Nathan Whitehorn. 2021 “Contribution of Secondary Neutrinos from Line-of-Sight Cosmic Ray Interactions to the IceCube Diffuse Astrophysical Flux”. *ApJ*, 914, p.91

TEACHING EXPERIENCE

Elementary Particle Physics Laboratory *September 2020 – December 2020*
 A cosmic-ray detector is simulated and built from a photomultiplier tube and scintillator. Contributed to development of the virtual course syllabus structure and content. Responsible for creation and oversight of the simulation component of this course; produced a cookbook for the construction of optical physics simulations catered towards students with minimal background in experimental particle physics. Produced original Python analysis and Geant4 simulation tutorials presented in class.

RECENT SELECTED STUDIES

Probability – Applied through research, self-study from “Probability: Theory and Examples” (Rick Durrett)

Analysis – Formal study at UCLA, as well as recent review

Statistical Mechanics – Formal study at UCLA, as well as recent self-study following “Statistical Mechanics of Lattice Systems” (Friedli and Velenik)

Nonlinear Dynamics, System Dynamics – Audited and in progress, TUM

Network Analysis – Self-study following Leonid Zhukov’s online lecture series

Classical Mechanics – MSU

Modeling Environmental and Social Systems – MSU

Radiative Astrophysics – MSU

Extragalactic Astrophysics and Cosmology – MSU

Quantum Field Theory – MSU

ISAPP 2023: Neutrino Physics, Astrophysics and Cosmology – INFN School (Varenna, Italy)

Special Topics in High-Energy Physics, Collider Phenomenology – MSU

TECHNICAL SKILLS

Mathematical Methods: Monte Carlo methods, likelihood-based inference, stochastic simulation, numerical simulation, numerical optimization.

Programming Languages: C, C++, Python, Bash, Perl, Java, Boost (with Python bindings via Boost.Python).

Mathematical Computing Software: Mathematica, SOLIDWORKS.

Relevant Libraries/Frameworks: TensorFlow, XGBoost, BLAS, LAPACK, Celerite2, NumPy, SciPy.

Scientific Software: Pythia, Geant4, Arduino, SCPI.

Domain-Specific Data Processing: ROOT (particle physics data processing), IceTray (high-energy neutrino and cosmic-ray data processing), VEGAS and FermiTools (gamma-ray data processing).

Distributed Computing: TORQUE, Sun Grid Engine, Slurm, HTCondor.

Computing Experience: Extensive experience with CPU/GPU simulations and model training. Efficient parallelization of tasks across resources.

Communication: GitHub, LaTeX, Overleaf, Wiki Markup, Microsoft Office, Google Workspace.

Backend/Frontend Development: HTML, CSS.

SERVICE	IceCube Neutrino-Sources Technical Lead Technical lead for the IceCube Collaboration Neutrino-Sources (astrophysics) working group. Oversee software reviews for analyses, provide assistance with software, likelihood implementation, data and computing resources.	<i>March 2024 – present</i>
	MSU Physics Graduate Organization President President of the MSU Physics Graduate Organization. Involvement in departmental advisory. Supported student-organized services and representatives. Assisted departmental leadership in communicating effectively with the student body during periods of funding instability and policy changes. Provided students with resources during periods of instability. Led survey to understand student needs and experiences.	<i>July 2024 – July 2025</i>
	Graduate Colloquium Committee Representative Organized and hosted student-postdoctoral lunches with visiting colloquium speakers. Worked with local colloquium committee to improve departmental colloquium experience and attendance.	<i>July 2023 – October 2024</i>
	HEP Social Organization Hosted socials and happy hours for the high-energy physics (HEP) group at MSU.	<i>July 2023 – December 2024</i>
OUTREACH	Astronomy on Tap, “IceCube and Astrophysical Neutrinos” Invited to speak on IceCube and neutrino astrophysics for a public audience in East Lansing, Michigan.	<i>July 2024</i>
	Outreach Activity, “Academic Research and Community with IceCube” Developed an outreach event for high school students at St. Catherine of Siena Academy (Wixom, MI). Presented on my own work with IceCube, entering science and academia, and led a guided discussion with small groups to consider the lifestyle of a researcher, bridging potential misconceptions held about STEM education and careers. Assessed activity efficacy with an IRB-approved survey.	<i>January 2023</i>
	STEM Ambassador Program Accepted into the 2022 cohort of the NSF-supported STEM Ambassador Program (STEMAP). Attended a set of regular workshops to learn best practices for outreach and in building community trust in science. Developed and carried out a novel outreach activity.	<i>September 2022 – February 2023</i>
	UCLA Exploring Your Universe (EYU) Science Fair Presenter at UCLA’s Exploring Your Universe fair. Helped manage organization of the 2020 cosmology and astroparticle physics virtual booth.	<i>November 2018, 2020</i>
	Head Telescope Operator, UCLA Public Viewing Nights Organized weekly shows, presented scientific background to audiences, and mentored club members.	<i>September 2017 – February 2019</i>
LANGUAGES	English – Native Spanish – Limited working proficiency (five years of classroom study) German – Elementary proficiency (B1 level)	
HOBBIES	Regular – Running and weight-training for sport pole dance Less-frequent – Mixing and creating music with Ableton, water and oil painting	